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(54) Title: METHODS AND COMPOSITIONS FOR REGULATION AND MANIPULATION OF STEROIDOGENESIS

(57) Abstract: The steroidogenic acute regulatory protein (StAR), a mitochondrial protein required for stress responses, reproduction, and sexual differentiation of male fetuses is shown to exert its activity transiently at the outer mitochondrial membrane (OMM) rather than in its final resting place in the matrix, and that its OMM residency time and activity are regulated by its speed of mitochondrial import. This may be the first example of a mitochondrial protein exerting its biological activity in a compartment other than that to which it is finally targeted. This unique system which permits steroidogenic cells to initiate and terminate massive levels of steroidogenesis within a few minutes, permitting the rapid regulation of serum steroid hormone concentrations therefore can be manipulated by altering the binding of the leader sequence for the StAR protein to its receptor on the OMM.